Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-12. (canceled)

13. (currently amended) A method for forming a reactant gas mixture in a safe and efficient manner before being reacted, comprising the steps of:

providing a tank containing a liquid;

injecting a first feed gas into said liquid in a manner effective to subdivide the first feed gas into bubbles within the liquid;

separately injecting a second feed gas into said liquid in a manner effective to subdivide the second feed gas into bubbles within the liquid;

forming a gas-induced liquid turbulent region in at least a portion of said liquid, wherein said forming step comprises passing the hydrocarbon gas and the oxygen-containing gas through said portion of liquid at a total gas superficial velocity of between about 5 cm/sec and about 60 cm/sec;

passing bubbles of said first and second feed gases through said gas-induced liquid turbulent region ~~so as~~ to induce gas transfer between the bubbles and to form a reactant gas mixture comprising the first and second feed gases; and

supplying at least a portion of the reactant gas mixture to a reaction zone.

14. (currently amended) The method of claim 13 wherein ~~forming a gas-induced liquid turbulent region employs passing a gas superficial velocity of the combined hydrocarbon gas and oxygen-containing gas~~ the total gas superficial velocity is between ~~about 5 cm/sec and about 60 cm/sec~~ 10 cm/sec and 60 cm/sec.

15. (currently amended) The method of claim 14 wherein forming a gas-induced liquid

turbulent region further includes using a powered mechanical device, a fluid circulation system, a static internal structure, or combinations thereof.

16. (original) The method of claim 13 wherein the first feed gas comprises a hydrocarbon gas and the second feed gas comprises an oxygen-containing gas.

17. (original) The method of claim 16 wherein the reactant gas mixture has a O_2-to-carbon molar ratio between about 0.1:1 and about 0.8:1.

18. (original) The method of claim 16 wherein the reactant gas mixture has a O_2-to-carbon molar ratio between about 0.45:1 and about 0.65:1.

19. (currently amended) The method of claim 13 further comprising maintaining a pressure between about 300 kPa – 3350 kPa ~~psig~~ within the tank.

20. (original) The method of claim 13 wherein the tank comprises a column with a height-to-diameter aspect ratio between 1 and 15.

21. (original) The method of claim 20 further comprising heating the reactant gas mixture to a predetermined temperature before supplying the reactant gas mixture to the reactor.

22. (original) The method of claim 20 wherein the liquid comprises water, an organic liquid, or combinations thereof.

23. (currently amended) A method for the oxidation of hydrocarbons comprising:

providing a tank containing a liquid;

injecting a hydrocarbon gas into said liquid in a manner effective to subdivide the hydrocarbon gas into bubbles within the liquid;

separately injecting an oxygen-containing gas into said liquid in a manner

effective to subdivide the oxygen-containing gas into bubbles within the liquid;

forming a gas-induced liquid turbulent region in at least a portion of said liquid, wherein said forming step comprises passing the hydrocarbon gas and the oxygen-containing gas through said portion of liquid at a total gas superficial velocity of between about 5 cm/sec and about 60 cm/sec;

passing bubbles of the hydrocarbon gas and of the oxygen-containing gas through said gas-induced liquid turbulent region ~~so as~~ to induce gas transfer between the bubbles and to form a reactant gas mixture comprising the hydrocarbon gas and the oxygen-containing gas;

supplying at least a portion of the reactant gas mixture to a ~~reactor~~ reaction zone, and

reacting at least a portion of said hydrocarbon gas with oxygen in said reaction zone to form a reaction product.

24. (currently amended) The method of claim 23 wherein ~~forming a gas-induced liquid turbulent region employs passing a gas superficial velocity of the combined hydrocarbon gas and oxygen-containing gas~~ the total gas superficial velocity is between ~~about 5 cm/sec and about 60 cm/sec~~ 10 cm/sec and 60 cm/sec.

25. (original) The system of claim 24 wherein the gas superficial velocity is between 10 and 45 cm/sec.

26. (currently amended) The method of claim 23 wherein forming a gas-induced liquid turbulent region ~~include~~ further includes using a powered mechanical device, a fluid circulation system, a static internal structure, ~~a high gas velocity,~~ or combinations thereof.

27. (currently amended) The method of claim 23 further comprising maintaining a pressure between about 300 kPa and about 3350 kPa ~~psig~~ within the tank.

28. (original) The method of claim 23 wherein the tank comprises a column with a height-to-diameter aspect ratio between 1 and 15.

29. (original) The method of claim 23 wherein the reactant gas mixture has a O_2-to-carbon molar ratio between about 0.1:1 and about 0.8:1.

30. (original) The method of claim 29 wherein the reactant gas mixture has a O_2-to-carbon molar ratio between about 0.45:1 and about 0.65:1.

31. (currently amended) The method of claim 23 further comprising heating the reactant gas mixture to a predetermined temperature before supplying the reactant gas mixture to the ~~reactor~~ reaction zone.

32. (original) The method of claim 23 wherein the liquid comprises water, an organic liquid, or combinations thereof.

33. (original) The method of claim 32 wherein the organic liquid comprise a hydrocarbon liquid or a mixture of liquid hydrocarbons.

34. (currently amended) The method of claim 23 wherein the ~~reactor~~ reaction zone comprises a partial oxidation zone, and the reaction product comprises hydrogen and carbon monoxide.

35. (currently amended) The method of claim 34 wherein the partial oxidation zone comprises a catalyst.

36. (original) The method of claim 23 wherein the reactant gas mixture further comprises at least a portion of said liquid.

37. (original) A process for producing C_{5+} hydrocarbons comprising:

providing a tank containing a liquid;

injecting a hydrocarbon gas into said liquid in a manner effective to subdivide the hydrocarbon gas into bubbles within the liquid;

separately injecting an oxygen-containing gas into said liquid in a manner effective to subdivide the oxygen-containing gas into bubbles within the liquid;

forming a gas-induced liquid turbulent region in at least a portion of said liquid, wherein said forming step comprises passing the hydrocarbon gas and the oxygen-containing gas through said portion of liquid at a total gas superficial velocity of between about 5 cm/sec and about 60 cm/sec;

passing bubbles of the hydrocarbon gas and of the oxygen-containing gas through said gas-induced liquid turbulent region ~~so as~~ to induce gas transfer between the bubbles and to form a reactant gas mixture comprising the hydrocarbon gas and the oxygen-containing gas;

supplying at least a portion of the reactant gas mixture to a partial oxidation reactor;

reacting at least a portion of said hydrocarbon gas with oxygen in the [[a]] partial oxidation reactor to form a syngas stream comprising carbon monoxide and hydrogen;

feeding at least a portion of the syngas stream to a hydrocarbon synthesis reactor comprising a hydrocarbon synthesis catalyst; and

converting at least a portion of said syngas stream in the hydrocarbon synthesis reactor to form C_{5+} hydrocarbons.

38. (new) The method of claim 13 wherein the reactant gas entering the reaction zone has a gas velocity between about 3 cm/s and about 6100 cm/s.

39. (new) The method of claim 15 wherein the fluid circulation system includes an external gas recirculation.

40. (new) The method of claim 15 wherein the fluid circulation system includes an internal liquid recirculation.

41. (new) The method of claim 15 wherein the powered mechanical device comprises at least one paddle, at least one stirrer, at least one impeller, at least one propeller, or combinations thereof.

42. (new) The method of claim 15 wherein the static internal structure comprises at least one baffle, at least one perforated plate, a packing material, a heat-exchange device, or combinations thereof.

43. (new) The method of claim 16 wherein the hydrocarbon gas comprises methane.

44. (new) The method of claim 22 wherein the organic liquid comprise a liquid selected from the group consisting of biodiesel, alcohol, mineral oil, a vegetable oil, hydrocarbon wax, lubricating oil, diesel, naphtha, and gasoline.

45. (new) The method of claim 23 wherein the liquid-turbulent mixing region and the reaction zone are integrated into a single vessel.

46. (new) The method of claim 23 wherein the reaction zone is disposed above the tank.

47. (new) The method of claim 23 wherein the reactant gas entering the reaction zone has a gas velocity between about 3 cm/s and about 6100 cm/s.

48. (new) The process of claim 37 wherein the total gas superficial velocity is between 10 cm/sec and 60 cm/sec.

49. (new) The process of claim 37 wherein the reactant gas entering the partial oxidation reactor has a gas velocity between about 3 cm/s and about 6100 cm/s.